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EXAMINER	
PATTON, SPENCER D	
ART UNIT	**PAPER NUMBER**
3664	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/559,689	LEBRUN, JEAN-LOUIS	
	Examiner	Art Unit	
	SPENCER PATTON	3664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 September 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 December 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The amendments filed 9/1/2009 have been entered. Claims 23-44 are pending.

Drawings

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. Page 5, lines 20-33 of the specification as originally filed indicate that the illustration of Figure 1 is a known type of redundant architecture. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 34-44 are objected to because of the following informalities:

Claim 34, last line, "sample" should be changed to --sampling--.

Claims 35-43, "the multiple anti-noise digital filter is a _____ filter" should be changed to --the multiple anti-noise digital filters are _____ filters--.

Claim 44, "the multiple anti-noise digital filter has a" should be changed to --the multiple anti-noise digital filters have a--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 23** is rejected under 35 U.S.C. 102(b) as being anticipated by Welsh et al (US Publication No. 2002/0118844).

Welsh et al teaches:

Re claim 23. A method for processing information output by a primary flight equipment mounted on board an aircraft (gearbox housing 140 and sensors 106 on helicopter, Figure 3), in a form sampled at a first rate (sampler 114, Figure 1; paragraph [0021]) for being delivered after processing, to a flight conduct system of the aircraft (system, Figure 1), in a form sampled at a second rate lower than the first rate (downsampler 117a; paragraph [0027]), wherein the samples of information output by an item of primary flight equipment are submitted to an anti-noise digital filtering carried out at the first sampling rate (low-pass anti-aliasing filter 124a, Figure 1; and paragraphs [0007 and 0027]).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claim 34** is rejected under 35 U.S.C. 103(a) as being unpatentable over applicant admitted prior art in view of Welsh et al (US Publication No. 2002/0118844) and Smith (The Scientist and Engineer's Guide to Digital Signal Processing).

Figure 1 and page 5, lines 20-33 of the specification as originally filed teach:

Re claim 34. A device with redundant architecture with two parallel lines for the processing of signals from primary flight equipment mounted on board an aircraft, said signals being available at a first rate, in a sampled form and as several versions and intended to be delivered after processing, still as several versions, to a flight conduct system of the aircraft, in a form sampled at a second rate lower than the first rate,

Applicant admitted prior art fails to specifically teach: **(re claim 34)** wherein the device comprises, at the head of each line, following a buffer memory, an anti-noise digital filter filtering in parallel with the other anti-noise digital filters the various available versions of signals from the primary flight equipment and operating, like the buffer memory at the first sample rate.

Welsh et al teaches, at Figure 1 and paragraphs [0007 and 0027], a digital anti-aliasing filter being used in analyzing signals onboard an aircraft to remove aliasing noise from a signal. This filter operates at the frequency the signal was sampled at.

Smith teaches, at page 507, that a buffer must precede a filter so that the filter can have access to a certain number of the most recent samples.

In view of Welsh et al and Smith's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the device as taught by applicant admitted prior art, **(re claim 34)** wherein the device comprises, at the head of each line, following a buffer memory, an anti-noise digital filter filtering in parallel with the other anti-noise digital filters the various available versions of signals from the primary flight equipment and operating, like the buffer memory at the first sample rate; since Welsh et al teaches an anti-noise digital filter for removing the aliasing noise of a signal, and Smith teaches filters, such as that taught by Welsh et al, should follow buffers, such as that illustrated at 20 and 21 of Figure 1 of the present application.

8. **Claims 32, 34, and 43** are rejected under 35 U.S.C. 103(a) as being unpatentable over Welsh et al (US Publication No. 2002/0118844) in view of Gyde et al (EP 0 913 746) and Smith (The Scientist and Engineer's Guide to Digital Signal Processing).

Welsh et al teaches:

Re claim 34. A device with signals being available at a first rate (sampler 114, Figure 1; paragraph [0021]), in a sampled form and intended to be delivered after processing to

a flight conduct system of the aircraft (controller 118, Figure 1), in a form sampled at a second rate lower than the first rate (downsampler 117a; paragraph [0027]), wherein the device comprises, at the head of each line, an anti-noise digital filter filtering the signals from the primary flight equipment and operating, like the buffer memory at the first sample rate (low-pass anti-aliasing filter 124a, Figure 1; and paragraphs [0007 and 0027]).

Welsh et al fails to specifically teach: **(re claim 34)** redundant architecture with two parallel lines for the processing of signals from primary flight equipment mounted on board an aircraft; signals available as several versions; delivered after processing, still as several versions, to a flight conduct system of the aircraft; a filter filtering in parallel with the other anti-noise digital filters the various available versions of signals

Gyde et al teaches, at the abstract, Figures 2B and 3, having redundant inputs to a control unit, such as an autopilot system so that the system may automatically revert to valid sensors. Figure 3 shows the system maintains parallel lines for the processing of signals through the filtering stage and into the comparison stage, which may be considered analogous to the controller 118 of Welsh et al.

In view of Gyde et al's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the device as taught by Welsh et al, **(re claim 34)** redundant architecture with two parallel lines for the processing of signals from primary flight equipment mounted on board an aircraft; signals available as several versions; delivered after processing, still as several versions, to a flight conduct

system of the aircraft; a filter filtering in parallel with the other anti-noise digital filters the various available versions of signals; since Gyde et al teaches a redundant system allows for automatic selection of valid sensors.

Welsh et al as modified by Gyde et al fails to specifically teach: **(re claim 34)** buffer memory; **(re claims 32 and 43)** wherein the filtering is filtering with sliding average operating on several samples.

Smith teaches, at page 507, that filtering requires a circular buffering memory to work properly. Smith also teaches, on page 350, that moving average is the preferred method for filtering due to its increased execution speed over a single pole filter.

In view of Smith's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the signal processing system as taught by Welsh et al as modified by Gyde et al, **(re claim 34)** buffer memory; **(re claims 32 and 43)** wherein the filtering is filtering with sliding average operating on several samples; since Smith teaches that buffer memory is required for filtering, and that moving average is the preferred method for filtering due to its increased execution speed.

9. **Claims 24 and 35** are rejected under 35 U.S.C. 103(a) as being unpatentable over Welsh et al (US Publication No. 2002/0118844) in view of Gyde et al (EP 0 913 746) and Smith (The Scientist and Engineer's Guide to Digital Signal Processing) as

applied to claims 23 and 34 above, and further in view of Hanna (US Patent No. 4,996,423).

The teachings of Welsh et al as modified by Gyde and Smith have been discussed above. Welsh et al as modified by Gyde and Smith fails to specifically teach: **(re claims 24 and 35)** wherein the anti-noise digital filtering is an anti-aliasing filtering disabling the frequency components higher than half the second sampling rate.

Hanna teaches, at Column 6, lines 16-42, attenuating the frequency components above one half the sampling frequency to eliminate folding effects.

In view of Hanna's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the method and device as taught by Welsh et al as modified by Gyde and Smith, **(re claims 24 and 35)** wherein the anti-noise digital filtering is an anti-aliasing filtering disabling the frequency components higher than half the second sampling rate; since Hanna teaches the frequency components above one half of the sampling frequency should be attenuated to eliminate folding effects.

10. **Claims 25, 26, 36, and 37** are rejected under 35 U.S.C. 103(a) as being unpatentable over Welsh et al (US Publication No. 2002/0118844) in view of Gyde et al (EP 0 913 746) and Smith (The Scientist and Engineer's Guide to Digital Signal Processing) as applied to claims 23 and 34 above, and further in view of Lin et al (US Patent No. 6,671,342).

The teachings of Welsh et al in view of Smith and Gyde et al have been discussed above. Welsh et al in view of Smith and Gyde et al fails to specifically teach: **(re claims 25 and 36)** wherein the anti-noise digital filtering is an anti-aliasing filtering disabling the frequency components lower than half the first sampling rate; and **(re claims 26 and 37)** wherein the anti-noise digital filtering is an anti-aliasing filtering disabling the frequency components higher than half the second sampling rate and those of frequency lower than half the first sampling rate.

Lin et al teaches, at Figure 5, using a Nyquist high pass prefilter in combination with the low pass filter to effectively clean a signal.

In view of Lin et al's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the signal processing system as taught by Welsh et al in view of Smith and Gyde et al; **(re claims 25 and 36)** wherein the anti-noise digital filtering is an anti-aliasing filtering disabling the frequency components lower than half the first sampling rate; and **(re claims 26 and 37)** wherein the anti-noise digital filtering is an anti-aliasing filtering disabling the frequency components higher than half the second sampling rate and those of frequency lower than half the first sampling rate; since Lin et al teaches using a Nyquist high pass prefilter in conjunction with a low pass filter to produce a usable signal.

11. **Claims 27-29 and 38-40** are rejected under 35 U.S.C. 103(a) as being unpatentable over Welsh et al (US Publication No. 2002/0118844) in view of Gyde et al (EP 0 913 746) and Smith (The Scientist and Engineer's Guide to Digital Signal

Processing) as applied to claims 23 and 34 above, and further in view of Lesurf (Filters Order, order!).

The teachings of Welsh et al in view of Smith and Gyde et al have been discussed above. Welsh et al in view of Smith and Gyde et al fails to specifically teach: **(re claims 27 and 38)** wherein the filtering is a first-order low-pass filtering; **(re claims 28 and 39)** wherein the filtering is a second-order low-pass filtering; **(re claims 29 and 40)** wherein the filtering is a low-pass filtering of Butterworth type.

Lesurf teaches, at 3.2, that first order and second order filters are art recognized functional equivalents of each other. Lesurf also teaches, in the last paragraph, that Butterworth filters are standard and can be used to optimize properties for a given application.

In view of Lesurf's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the signal processing system as taught by Welsh et al in view of Smith and Gyde et al, **(re claims 27 and 38)** wherein the filtering is a first-order low-pass filtering; **(re claims 28 and 39)** wherein the filtering is a second-order low-pass filtering; **(re claims 29 and 40)** wherein the filtering is a low-pass filtering of Butterworth type; since Lesurf teaches that these are standard types of filters commonly used in signal processing and that first and second order filters are art recognized functional equivalents for performing a low pass filtering.

12. **Claims 30 and 41** are rejected under 35 U.S.C. 103(a) as being unpatentable over Welsh et al (US Publication No. 2002/0118844) in view of Smith (The Scientist and

Engineer's Guide to Digital Signal Processing), Gyde et al (EP 0 913 746), Lin et al (US Patent No. 6,671,342) and Lesurf (Filters Order, order!) as applied to claims 23, 26, 29, 34, 37, and 40 above.

The teachings of Welsh et al in view of Gyde et al, Lin et al, and Lesurf have been discussed above. Welsh et al in view of Gyde et al, Lin et al, and Lesurf fails to specifically teach: **(re claims 30 and 41)** wherein the filtering is a bandstop filtering of Butterworth type.

Smith teaches, at Figure 14-9 on page 275, that a band-reject filter is simply the combination of high pass and low pass filters which do not overlap.

In view of Smith's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the signal processing system as taught by Welsh et al in view of Gyde et al, Lin et al, and Lesurf, **(re claims 30 and 41)** wherein the filtering is a bandstop filtering of Butterworth type; since Smith teaches that a bandstop filter is a simplified version of what was constructed in re claims 26 and 37 and as mentioned in re claims 29 and 40, Butterworth filters are standard and can be used to optimize properties for a given application.

13. **Claims 31 and 42** are rejected under 35 U.S.C. 103(a) as being unpatentable over Welsh et al (US Publication No. 2002/0118844) as modified by Smith (The Scientist and Engineer's Guide to Digital Signal Processing), and Gyde et al (EP 0 913 746), as applied to claims 23 and 34 above, and further in view of Detlefsen (US Publication No. 2003/0231083).

The teachings of Welsh et al in view of Smith and Gyde et al have been discussed above. Welsh et al in view of Smith and Gyde et al fails to specifically teach: **(re claims 31 and 42)** wherein, when the processed information originating from a primary flight equipment is affected by noise exhibiting energy spikes, the anti-noise digital filtering is a filtering with stopbands corresponding to the energy spikes of the noise.

Detlefsen teaches, at paragraph [0006], using a filter to eliminate spikes from a signal with a stopband.

In view of Detlefsen's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the signal processing system as taught by Welsh et al in view of Smith and Gyde et al, **(re claims 31 and 42)** wherein, when the processed information originating from a primary flight equipment is affected by noise exhibiting energy spikes, the anti-noise digital filtering is a filtering with stopbands corresponding to the energy spikes of the noise; since Detlefsen teaches using such a method to eliminate unwanted spikes from a signal.

14. **Claims 33 and 44** are rejected under 35 U.S.C. 103(a) as being unpatentable over Welsh et al (US Publication No. 2002/0118844) as modified by Smith (The Scientist and Engineer's Guide to Digital Signal Processing), and Gyde et al (EP 0 913 746) as applied to claims 23 and 34 above, and further in view of Kiss et al (US Patent No. 6,460,803).

The teachings of Welsh et al in view of Smith and Gyde et al have been discussed above. Welsh et al in view of Smith and Gyde et al fails to specifically teach: **(re claims 33 and 44)** wherein the filtering implements a transfer function dependent on the flight configuration of the aircraft.

Kiss et al teaches, at column 21, lines 33-48, compensating the plant every few seconds to adjust for changes in the transfer function caused by changes in flight conditions.

In view of Kiss et al's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to include, with the signal processing system as taught by Welsh et al in view of Smith and Gyde et al, **(re claims 33 and 44)** wherein the filtering implements a transfer function dependent on the flight configuration of the aircraft; since Kiss et al teaches that on the fly adjustments in response to flight conditions are preferred.

Response to Arguments

15. Applicant's arguments with respect to Blackwell as applied to claims 23-44 have been considered but are moot in view of the new ground(s) of rejection.

16. Applicant's arguments filed 9/1/2009 have been fully considered but they are not persuasive.

17. Applicant argues on page 8 that the sensor invalidation system of Gyde does not include redundant parts. However the abstract states that this is a redundant system, and Figures 2B and 3 illustrate redundant sensors and filters.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Leonard et al (US Patent No. 6,215,408) also teaches a system which performs anti-alias filtering on a signal prior to decimation (see 110 and 8, Figure 1; and column 10, lines 62-65). This filter attenuates the frequencies beyond half the decimation frequency.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SPENCER PATTON whose telephone number is (571)270-5771. The examiner can normally be reached on Monday-Thursday 7:30-5:00; Alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Khoi Tran can be reached on (571)272-6919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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